

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Ziech et al.

Serial No.: 10/660,239

Group Art Unit: 3616

Filed: 09/11/2003

Examiner: Dunn, D.

For: Tapered Sleeve Suspension Arm Joint

Atty. Dkt. No.: 60,680-543

Commissioner for Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

**REPLY BRIEF PURSUANT TO 37 C.F.R. § 41.41**

Dear Sir:

Appellants submit this Reply Brief for consideration by the Board of Patent Appeals and Interferences pursuant to 37 C.F.R. § 41.41. The Patent and Trademark Office is hereby authorized to charge any fees required or to credit any overpayment of fees to deposit account 04-2223.

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## I. ARGUMENTS

Appellants write to address issues raised in the "Response to Argument" section of the Examiner's Answer.

### A. Rejection of Claims 1-3 and 5-7 Under 35 U.S.C. §103(a) as Unpatentable over U.S. Patent No. 6,491,314 in view of U.S. Patent No. 5,005,913.

Claims 1-3 and 5-7 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,491,314 ("Smith et al.") in view of U.S. Patent No. 5,005,913 ("Kittle et al."). Appellants respectfully submit that the rejection of claims 1-3 and 5-7 under 35 U.S.C. § 103(a) is improper because there is no suggestion or motivation to combine the teachings of Smith et al. and Kittle et al. and because the combination of Smith et al. and Kittle et al. fails to disclose or suggest all of the limitations in at least some of the claims.

#### 1. Rejection of Claims 1-2 and 5-7

Independent claim 1 recites a "suspension" including a "control arm...defining a first sleeve disposed about an axis through which said axle extends, said first sleeve having a radially inner surface that tapers; and a second sleeve...received within said first sleeve...said second sleeve having a radially outer surface that tapers complementary to said radially inner surface of said first sleeve." The Examiner identifies Smith et al. as disclosing a suspension including a suspension control arm defining a first sleeve 542 and a second sleeve 588 received within the control arm sleeve. Office Action of April 6, 2006, p. 2 and Examiner's Answer p. 3. The Examiner acknowledges that neither sleeve 542, 588 in Smith et al. tapers. *Id.* The Examiner asserts, however, that Kittle et al. discloses complementary tapered sleeves in the form of wheel hub 10 and sleeve 14a (with sleeve 14a forming part of an assembly used to adjust the axial position of the wheel hub 10 along an axle) and that it would have been obvious to modify Smith et al.

in view of Kittle et al. “to provide tapered sleeves in order to better secure the axle to the control arm.” Office Action of April 6, 2006, p. 3 and Examiner’s Answer pp. 3-4. Appellants respectfully disagree.

In Appellants original Appeal Brief, Appellants noted that element 588 in Smith—identified by the Examiner as the “second sleeve”—is an “elastomer sheet...made of urethane or rubber sheet material....” Col. 21, lines 1-6. The elastomer sheet 588 allows the axle 524 to “articulate somewhat within the beam collar....” Col. 21, lines 10-11 and 18-19. Smith et al. notes that the purpose of the articulation is to “give flexibility to the beams to accommodate stresses due to roll of the axle.” Col. 22, lines 1-3. Appellants further argued that, because the purpose of the sheet 588 is to allow articulation of the axle beam relative to the control arm, modifying the suspension of Smith et al. to “better secure the axle to the control arm” as asserted by the Examiner would defeat the stated purpose of sheet 588. Appellants therefore submit that one of ordinary skill in the art would not have been motivated to modify the suspension of Smith et al. to taper “sleeves” 542 and 588 and there is no suggestion or motivation for combining the teachings of Smith et al. and Kittle et al.

In the Examiner’s Answer, the Examiner argues that there is a need to hold the axle “in place against lateral movement” and that the elastomeric sheet 588 can be modified to allow articulation and still hold the axle in place because of the elastic properties of sheet 588. Examiner’s Answer p. 5. As Appellants argued in the Appeal Brief, however, Smith et al. already disclose structure for rigidly coupling the trailing arm 518 to the axle 524 and thereby preventing relative lateral movement. Referring to Figures 43-44 and 48, Smith et al. uses a pair of “beam-axle connectors” 564 on either

side of trailing arm 518 to secure arm 518 to axle 524. Each beam axle connector 564 is “rigidly connected” to the axle 524 by compressive force. Col. 20, lines 43-58 and col. 21, lines 12-13. Because Smith et al. already teach structure for rigidly securing the trailing arm 518 to axle 524—and notably structure that is separate from the structure used to allow articulation—it is again unclear why one of ordinary skill in the art would be motivated to modify elastomeric sheet 588 to “better secure the axle to the control arm” as asserted by the Examiner.

In the Examiner’s Answer, the Examiner argues in response that modifying sheet 588 would still be useful to because it would “add the additional benefit of easier insertion of the axle.” Examiner’s Answer p. 6 This argument, however, rests on a false premise that the axle beam 524 is “inserted” into the sleeve 542 of the suspension arm. As shown in Figure 48, the sleeve 524—like the beam axle connectors 564—is formed by bringing semicircular bands together once the axle beam 524 has been put into position. The axle beam is, therefore, not “inserted” into the sleeve 542 at the end of the suspension arm. The Examiner also argues that modifying sheet 588 would “help to better hold and secure the control arm during installation, before the beam axle connectors were installed.” Examiner’s Answer p. 6. This argument, however, rests on an unsupported assumption regarding the method of assembly. In particular, there is simply no disclosure or suggestion in Smith et al. that assembly of the sleeve 542 of the suspension arm is completed before assembly of the beam axle connectors. In fact, given the common weld lines (see Figure 44, items 586, 590), one could just as easily surmise that the connections are made at substantially the same time.

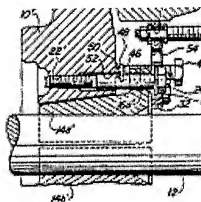
Because there is no suggestion or motivation to combine the teachings of Smith et al. and Kittle et al. Appellants submit that the rejection of claims 1-2 and 5-7 under 35 U.S.C. § 103(a) is improper. Accordingly, Appellants request that the rejection of claims 1-2 and 5-7 under 35 U.S.C. § 103(a) be overturned.

## 2. Rejection of Claim 3

Claim 3 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Smith et al. in view of Kittle et al. As set forth above in Section I.A.1, Appellants submit that there is no suggestion or motivation to combine the teachings of Smith et al. and Kittle et al. as asserted by the Examiner. Accordingly, Appellants submit that the rejection of claim 3 under 35 U.S.C. § 103(a) is improper. Appellants further submit that the combination of Smith et al. and Kittle et al. fails to teach or disclose all of the limitations recited in claim 3.

Claim 3 recites the additional limitation “wherein said radially inner surface of said first sleeve tapers radially inwardly away from each axial end of said first sleeve towards an axial midpoint of said first sleeve.” As discussed hereinabove, the “sleeves” 542 and 588 in Smith et al. identified by the Examiner do not taper at all. The Examiner argues, however, that Kittle et al. disclose a wheel hub 10 and sleeve 14a that meet the recited limitation. In Appellants original Appeal Brief, Appellants argued that, although wheel hub 10 and sleeve 14a in Kittle et al. both taper, neither “tapers radially inwardly away from each axial end...towards an axial midpoint...” as required by claim 3. Rather, the inner surface of wheel hub 10 and the outer surface of sleeve 14a taper continuously from one outboard axial end to the other inboard axial end as shown in Figure 5 of Kittle et al.:

U.S. Patent No. 5,005,913 Figure 5 (partial view)



In the Examiner's Answer, the Examiner argues that the sleeves in Kittle meet the recited limitation because "starting from either outside edge, the sleeve tapers inwardly toward the midpoint, and continuing on to the other side." Examiner's Answer p. 6. This argument is based on an improper definition of "tapers," however. The Examiner apparently defines "tapers" as simply a change in diameter—regardless of whether the diameter decreases or increases. The ordinary meaning of "taper," however is "to narrow":

**taper** *adj.*...1: progressively narrowed toward one end....

**taper** *vb.*...1: to become progressively smaller toward one end 2: to diminish gradually...

Webster's Ninth New Collegiate Dictionary, Merriam-Webster, Inc., p. 1206 (1984).

Because the sleeve 14a in Kittle constantly decreases (or increases depending on what axial end you begin on) throughout its axial length, the sleeve 14a cannot be said to "taper[] radially inwardly away from each axial end of said first sleeve towards an axial midpoint of said first sleeve" as recited in claim 3.



Because there is no suggestion or motivation to combine the teachings of Smith et al. and Kittle et al. and because the combination of Smith et al. and Kittle et al. fail to disclose or suggest all of the limitations recited in claim 3, Appellants submit that the rejection of claim 3 under 35 U.S.C. § 103(a) is improper. Accordingly, Appellants request that the rejection of claim 3 under 35 U.S.C. § 103(a) be overturned.

**B. Rejection of Claims 1-5, 7-12, 14, 18 and 20 Under 35 U.S.C. §103(a) as Unpatentable over U.S. Patent No. 6,491,314 in view of U.S. Patent No. 3,009,747.**

Claims 1-5, 7-12, 14, 18 and 20 stand rejected as being unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 6,491,314 (“Smith et al.”) in view of U.S. Patent No. 3,009,747 (“Pitzer”). Appellants respectfully submit that the rejection of claims 1-5, 7-14 and 18-20 under 35 U.S.C. § 103(a) is improper because there is no suggestion or motivation to combine the teachings of Smith et al. and Pitzer.

Independent claims 1, 8 and 18 each recite a “suspension” including a “control arm...defining a first sleeve disposed about an axis through which said axle extends, said first sleeve having a radially inner surface that tapers; and a second sleeve...received within said first sleeve...said second sleeve having a radially outer surface that tapers complementary to said radially inner surface of said first sleeve.” The Examiner identifies Smith et al. as disclosing a suspension including a suspension control arm defining a first sleeve 542 and a second sleeve 588 received within the control arm sleeve. Office Action of April 6, 2006, p. 2 and Examiner’s Answer p. 4. The Examiner acknowledges that neither sleeve 542, 588 in Smith et al. tapers. *Id.* The Examiner asserts, however, that Pitzer discloses complementary tapered sleeves in the form of mating rings 20, 1 disposed between a shaft 28 and journal housing 29 and that it would have been obvious to modify Smith et al. in view of Pitzer “to provide tapered sleeves in

order to better secure the axle to the control arm.” Office Action of April 6, 2006, p. 3. and Examiner’s Answer p. 4 Appellants respectfully disagree.

In Appellants original Appeal Brief, Appellants noted that element 588 in Smith—identified by the Examiner as the “second sleeve”—is an “elastomer sheet...made of urethane or rubber sheet material....” Col. 21, lines 1-6. The elastomer sheet 588 allows the axle 524 to “articulate somewhat within the beam collar....” Col. 21, lines 10-11 and 18-19. Smith et al. notes that the purpose of the articulation is to “give flexibility to the beams to accommodate stresses due to roll of the axle.” Col. 22, lines 1-3. Appellants further argued that, because the purpose of the sheet 588 is to allow articulation of the axle beam relative to the control arm, modifying the suspension of Smith et al. to “better secure the axle to the control arm” as asserted by the Examiner would defeat the stated purpose of sheet 588. Appellants therefore submit that one of ordinary skill in the art would not have been motivated to modify the suspension of Smith et al. to taper “sleeves” 542 and 588 and there is no suggestion or motivation for combining the teachings of Smith et al. and Pitzer

In the Examiner’s Answer, the Examiner argues that there is a need to hold the axle “in place against lateral movement” and that the elastomeric sheet 588 can be modified to allow articulation and still hold the axle in place because of the elastic properties of sheet 588. Examiner’s Answer p. 7. As Appellants argued in the Appeal Brief, however, Smith et al. already disclose structure for rigidly coupling the trailing arm 518 to the axle 524 and thereby preventing relative lateral movement. Referring to Figures 43-44 and 48, Smith et al. uses a pair of “beam-axle connectors” 564 on either side of trailing arm 518 to secure arm 518 to axle 524. Each beam axle connector 564 is


“rigidly connected” to the axle 524 by compressive force. Col. 20, lines 43-58 and col. 21, lines 12-13. Because Smith et al. already teach structure for rigidly securing the trailing arm 518 to axle 524—and notably structure that is separate from the structure used to allow articulation—it is again unclear why one of ordinary skill in the art would be motivated to modify elastomeric sheet 588 to “better secure the axle to the control arm” as asserted by the Examiner.

In the Examiner’s Answer, the Examiner argues in response that modifying sheet 588 would still be useful to because it would “add the additional benefit of easier insertion of the axle.” Examiner’s Answer p. 8. This argument, however, rests on a false premise that the axle beam 524 is “inserted” into the sleeve 542 of the suspension arm. As shown in Figure 48, the sleeve 524—like the beam axle connectors 564—is formed by bringing semicircular bands together once the axle beam 524 has been put into position. The axle beam is, therefore, not “inserted” into the sleeve 542 at the end of the suspension arm. The Examiner also argues that modifying sheet 588 would “help to better hold and secure the control arm during installation, before the beam axle connectors were installed.” Examiner’s Answer p. 8. This argument, however, rests on an unsupported assumption regarding the method of assembly. In particular, there is simply no disclosure or suggestion in Smith et al. that assembly of the sleeve 542 of the suspension arm is completed before assembly of the beam axle connectors. In fact, given the common weld lines (see Figure 44, items 586, 590), one could just as easily surmise that the connections are made at substantially the same time.

Because there is no suggestion or motivation to combine the teachings of Smith et al. and Pitzer, Appellants submit that the rejection of claims 1-5, 7-12, 14, 18 and 20

under 35 U.S.C. § 103(a) is improper. Accordingly, Appellants request that the rejection of claims 1-5, 7-12, 14, 18 and 20 under 35 U.S.C. § 103(a) be overturned.

Respectfully submitted,

  
William F. Kolakowski III  
Registration No. 41908  
Customer No. 26,127  
DYKEMA GOSSETT PLLC  
39577 Woodward Ave., Ste. 300  
Bloomfield Hills, MI 48304  
(248) 203-0822  
Attorney for Applicant

BH01\697701.1  
ID\WFK